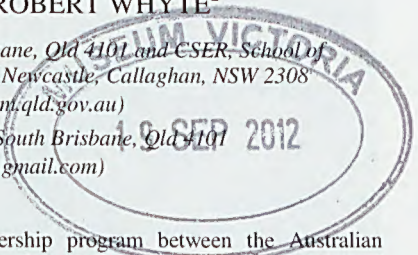


BIODIVERSITY DISCOVERY PROGRAM *BUSH BLITZ* SUPPLIES MISSING ANT SPIDER FEMALES (ARANEAE: ZODARIIDAE) FROM VICTORIA

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Abstract

Bush Blitz 2011, the biodiversity discovery partnership program between the Australian Government, BHP Billiton and Earthwatch Australia, has yielded key specimens of several zodariid species from Ned's Corner Station on Victoria's far north-west desert fringe, some previously known only from male holotypes. Females of *Pentasteron sordidum* Baehr & Jocqué, 2001 and *Pentasteron storosoides* Baehr & Jocqué, 2001 are described for the first time.

Introduction

Ned's Corner Station, a former sheep station on the fringe of the desert in Victoria's far north-west, is managed for conservation by Trust for Nature as part of the National Reserve System. It is a 30,000 ha property purchased in 2002 because of its importance in Victoria's conservation landscape.

The property is bordered by National Park to the south and the Murray River to the north. It provides important habitats for native plants and wildlife rarely, if ever, seen in other parts of the State. Plant species local to the region have been planted and nurtured.

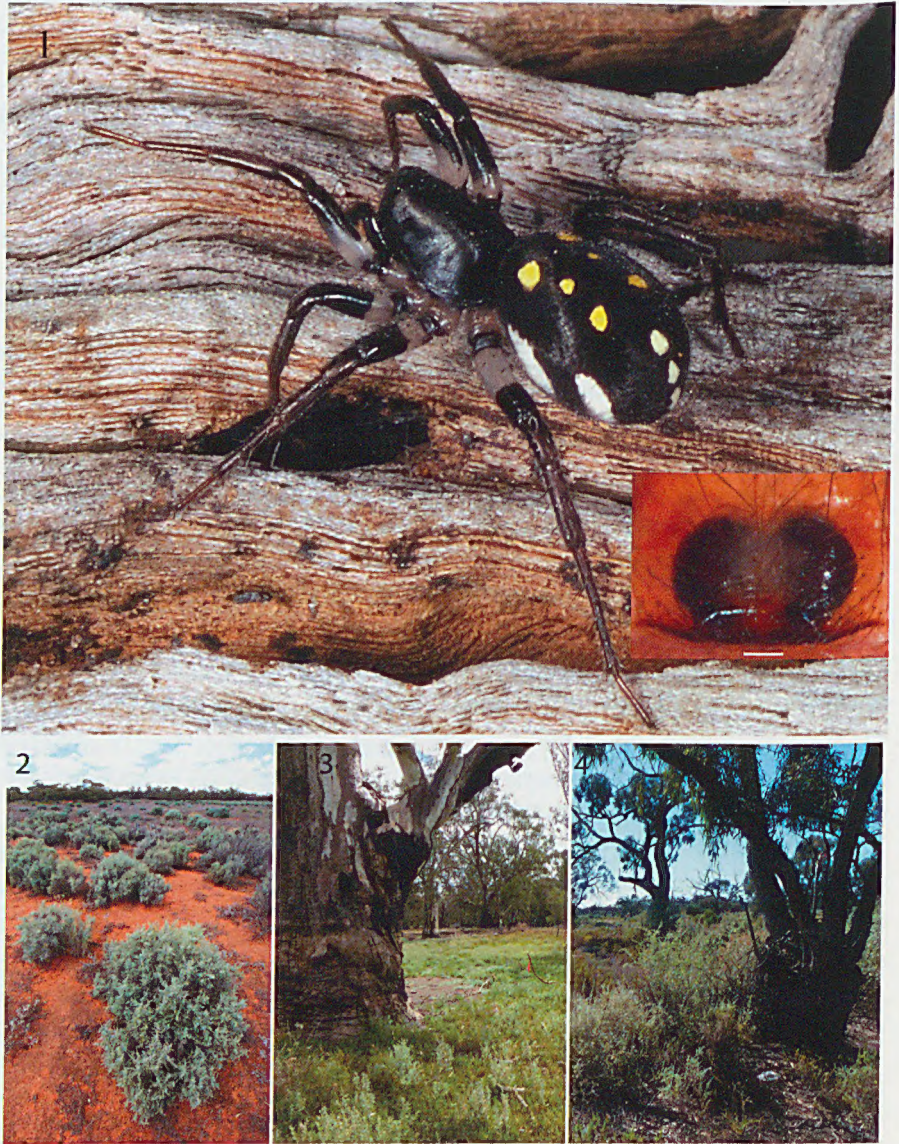
The reserve is dominated by open chenopod scrublands (Fig. 2) covering 88% of the land. Open Red Gum floodplain woodlands (Fig. 3) occupy 1.5% and Black Box floodplain woodlands (Fig. 4) occupy 3%.

Bush Blitz 2011 at Ned's Corner Station involved about 40 people, 30 of them leading Australian scientists. The 2011 team found many species new to science, including 14 new spider species.

Collection of zodariids yielded five species in four genera. All of them mimic ant behaviour and live with ants while feeding on them. Their mimicry extends in some cases to their ability to produce ant pheromones (Allan *et al.* 1996). One male and seven female specimens of *Pentasteron sordidum* Baehr & Jocqué, 2001 (Figs 5-12), previously known only from the male holotype, were collected. Large numbers of *Pentasteron storosoides* Baehr & Jocqué, 2001 (Figs 13-20), also known only from the male holotype, were found, 44 males and six females being collected.

Other zodariids collected include *Habronestes raveni* Baehr, 2003 (Fig. 1), *Holasteron spinosum* Baehr, 2004 (Figs 21-23) and *Zillimata scintillans* (O.P.- Cambridge, 1869) (Figs 24-26).

This paper provides colour images of these species and the first description of the females of *P. sordidum* and *P. storosoides*.



Figs 1-4. (1), *Habronestes raveni* female (S91142, Photo by Mark Norman); inset at lower right = epigyne ventral view (Scale = 0.1 mm). (2-4), Ned's Corner main habitats: (2) open chenopod scrubland, (3) open Red Gum woodland and (4) open Black Box woodland fringing the Murray River.

Material and methods

All zodariids were collected using pitfall traps and bark spraying. The latter technique involved thoroughly spraying the trunks of large trees using hand-held cans of Mortein Fast Knockdown insecticide, directing the jet of spray from the base to as far as possible up the trunk. Specimens were examined using a LEICA MZ16A microscope. Photo-micrographic images were produced using a Leica DFC 500 and the software program Auto-Montage Pro Version 5.02 (p). Female genitalia were cleared with pancreatin, as described by Alvarez-Padilla and Hormiga (2008). All measurements are in millimeters.

Abbreviations are used in the text as follows: A – atrium; ALE – anterior lateral eyes; AME – anterior median eyes; CD – copulatory duct; EA – embolar apophysis; E – embolus; LTA – lateral tegular apophysis; PLE – posterior lateral eyes; PME – posterior median eyes; S – spermathecae; VTA – ventral tegular apophysis. Institutional abbreviations used are: MV – Museum of Victoria, Melbourne; QM – Queensland Museum, Brisbane.

Systematics

Family Zodariidae Thorell, 1881

Pentasteron Baehr & Jocqué, 2001

Type species: *Pentasteron simplex* Baehr & Jocqué, 2001.

Diagnosis. Members of this genus can be identified by the male palpal tibiae, which have a deep retrolateral concavity combined with a pronounced concavity on the base of the cymbium. The tegulum has a broad base traversed by the seminal duct. It ends in a typical median apophysis (VTA) with a curved tip. Males of the following species were described by Baehr and Jocqué (2001).

Pentasteron sordidum Baehr & Jocqué, 2001

(Figs 5-12, 27)

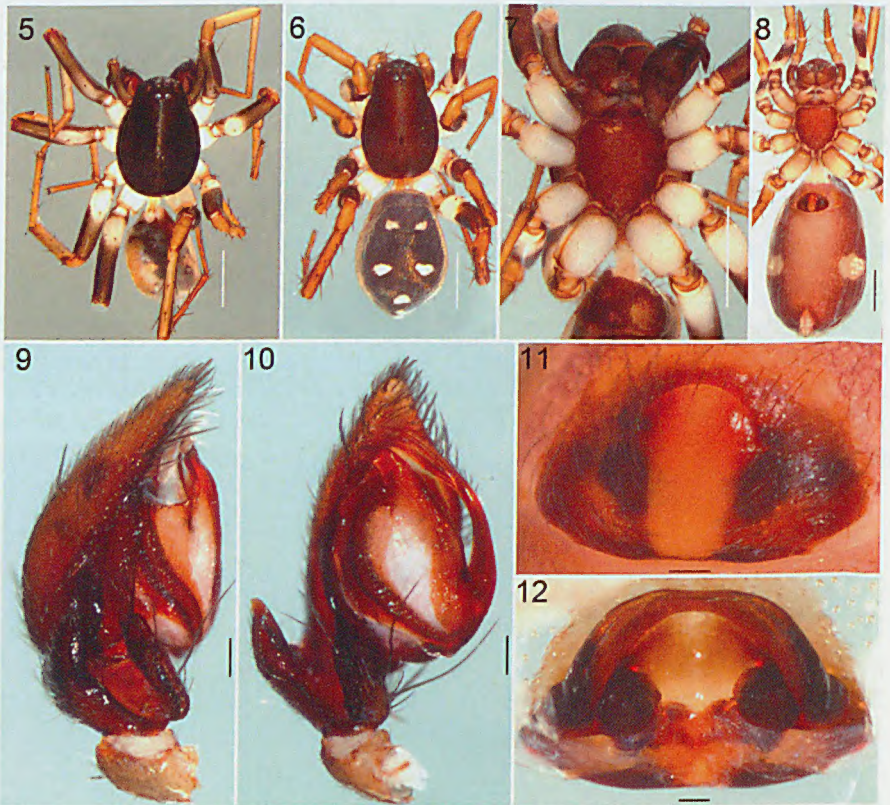
Type material examined. Holotype ♂, AUSTRALIA: New South Wales, Lake Wytchugga, 6 km W of Wilcannia, 31°30'S, 143°26'E, black box bark spray, 21-22.xii.1998, M. Baehr, deposited in QM (S46889).

Other material examined. 1 ♀, Victoria, Ned's Corner, 34°07'S, 141°17'E, pitfall, 22-29.xi.2011, B. Baehr, deposited in MV (K-11542); 1 ♀, same data as above (S91132); 1 ♂, same data except 34°08'S, 141°16'E (S91133); 1 ♀, same data except 34°07'S, 141°17'E (S91136); 4 ♀♀, same data except 34°12'S, 141°31'E (S91134, S91135).

Diagnosis. Males and females resemble *P. storosoides* in having a shiny black abdomen with two pairs of white spots in the front half and 3 crescent-shaped spots in front of the spinnerets (Fig. 6). The male palp has a deep tibial concavity but can be easily separated from other species by the large longitudinal ventrolateral swelling (Figs 9-10). Females can be separated from *P. storosoides* by the long inverted u-shaped atrium (Figs 11-12).

Female. Total length 6.35; carapace 2.45 long, 1.53 wide. Colour: Carapace chestnut brown; chelicerae and sternum medium brown; coxae pale; trochanter I-IV yellowish brown; femora I-IV white in proximal half, yellow overlaid with dark brown in distal half; other parts yellow. Abdomen dorsally shiny black with two pairs of white spots in the front half and 3 crescent-shaped spots in front of the spinnerets. Ventrally, yellowish in front of the epigastric fold and on lip in front of the tracheal spiracle. Carapace finely granulated; sternum smooth. Eyes: AME: 0.15; ALE: 0.13; PME: 0.14; PLE: 0.17; both eye rows strongly procurved. Epigyne (Figs 11-12) with long inverted u-shaped atrium, short curved copulatory ducts and laterally situated spermathecae (S).

Distribution. Western New South Wales and northwestern Victoria (Fig. 27).



Figs 5-12. *Pentasteron sordidum*: (5, 7, 9, 10) male (S91133); (6, 8, 11, 12) female (K-11542): (5-6) habitus dorsal view; (7-8) same ventral view; (9) right palp ventrolateral view; (10) same ventral view; (11) epigyne ventral view; (12) same dorsal view. Scale = habitus 1 mm, genitalia 0.1 mm.

Pentasteron storosoides Baehr & Jocqué, 2001

(Figs 13-20, 27)

Type material examined. Holotype ♂, AUSTRALIA: New South Wales, 30 km SW of Wilcannia, 32°25'S, 142°45'E, black box bark spray, 22.xii.1998, U. & M. Baehr, deposited in QM (S46948).

Other material examined. 1 ♀, Victoria, Ned's Corner, 34°12'S, 141°31'E, pitfall, 22-29.xi.2011, B. Baehr, deposited in MV (K-11544); 24 ♂♂, 2 ♀♀, same data as above (S91124, S91126); 3 ♂♂, same data except 34°08'S, 141°19'E (S91125, S91130); 4 ♂♂, same data except 34°08'S, 141°18'E (S91127); 3 ♂♂, 3 ♀♀, same data except 34°07'S, 141°16'E (S91128); 5 ♂♂, same data except 34°07'S, 141°17'E (S91129); 5 ♂♂, same data except 34°12'S, 141°31'E (S91131).

Diagnosis. Males resemble *P. sordidum* in having a palp with deep tibial concavity delimited by the large longitudinal swollen ventrolateral swelling but can be separated by a dorsolateral apophysis with recurved tip (Figs 17-18). Females can be separated by the small inverted v-shaped atrium and large coiled copulatory ducts ending in ventrally directed spermathecae (Figs 19-20).



Figs 13-20. *Pentasteron storosoides*: (13, 15, 17, 18) male (S91124); (14, 16, 19, 20) female (K-11544); (13-14) habitus dorsal view; (15-16) same ventral view; (17) right palp ventrolateral view; (18) same ventral view; (19) epigyne ventral view; (20) same dorsal view. Scale = habitus 1 mm, genitalia 0.1 mm.

Female: Total length 5.56; carapace 2.52 long, 1.63 wide. Colour: Carapace chestnut brown; chelicerae and sternum medium brown; coxae white with dark brown rim; trochanter I - IV dark; femora I - IV white with dark patches at base in proximal half, dark brown in distal half; remainder of legs yellowish brown, posterior tibiae with blackish lateral streaks. Abdomen shiny black; dorsum with two pairs of small white spots, one pair near the anterior edge, the other pair roughly half way towards the rear. Three crescent-shaped spots are in a line running lengthways immediately in front of spinnerets. The sides have one oblique white spot and pale mottling. Venter sepia, anterior lip of tracheal spiracle yellow brown. Carapace finely granulated; sternum smooth. Eyes: AME: 0.09; ALE: 0.13; PME: 0.14; PLE: 0.14. both eye rows strongly procurved. Colulus a small swelling with 8 setae. Epigyne with small inverted v-shaped atrium, large coiled copulatory ducts ending in ventrally directed spermathecae (Figs 19-20).

Distribution. Western New South Wales and northwestern Victoria (Fig. 27).



Figs 21-26. (21-23) *Holasteron spinosum* male (S91139); (24-26) *Zillimata scintillans* male (S91137). (21, 24) habitus dorsal view; (22, 25) right palp retrolateral view; (23, 26) same ventral view. Scale = habitus 1 mm, palps 0.1 mm.

Habronestes raveni Baehr, 2003

(Fig. 1)

Material examined. 1 ♀, Victoria, Ned's Corner, 34°12'S, 141°31'E, pitfall, 22-29.xi.2011, B. Baehr (S91142).

Holasteron spinosum Baehr, 2004

(Figs 21-23)

Material examined. 10 ♂♂, 4 ♀♀, Victoria, Ned's Corner, 34°12'S, 141°32'E, pitfall, 22-29.xi.2011, B. Baehr (S91142, S91140); 1 ♂, same data except 34°23'S, 141°20'E, pitfall, 23.xi.2011, P. Lillywhite (S91141).

Zillimata scintillans (O.P.-Cambridge, 1869)

(Figs 24-26)

Material examined. 1 ♂, Victoria, Ned's Corner, 34°12'S, 141°31'E, pitfall, 22-29.xi.2011, B. Baehr (S91138); 1 ♂, same data except 34°07'S, 141°17'E, pitfall, 22-29.xi.2011, B. Baehr (S91137).



Fig. 27. Distribution map of *P. sordidum* (circle) and *P. storosoides* (star); Ned's Corner, arrowed.

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References

- ALLAN, R.A., ELGAR, M.A. and CAPON, R.J. 1996. Exploitation of an ant chemical alarm signal by the zodariid spider *Habronestes bradley* Walckenaer. *Proceedings of the Royal Society of London* **263**: 69-73.
- ÁLVAREZ-PADILLA, F. and HORMIGA, G. 2008. A protocol for digesting internal soft tissues and mounting spiders for scanning electron microscopy. *Journal of Arachnology* **35**: 538-542.
- BAEHR, B.C. 2003. Revision of the Australian spider genus *Habronestes* (Araneae: Zodariidae). Species of New South Wales and Australian Capital Territory. *Records of the Australian Museum* **55**: 343-376.
- BAEHR, B.C. 2004. Revision of the new Australian genus *Holasteron* (Araneae: Zodariidae): taxonomy, phylogeny and biogeography. *Memoirs of the Queensland Museum* **49**: 495-519.
- BAEHR, B.C. and JOCQUÉ, R. 2001. Revisions of the genera in the *Asteron*-complex (Araneae, Zodariidae). The new genera *Pentasteron*, *Phenasteron*, *Leptasteron* and *Subasteron*. *Memoirs of the Queensland Museum* **46**: 359-385.
- CAMBRIDGE, O.P. 1869. Descriptions and sketches of some new species of Araneidea, with characters of a new genus by O.P.- Cambridge. *Annals and Magazine of Natural History* **3**: 52-74.